

CLAIMS

1. The use, for the manufacture of paper coating colors, of a copolymer as an agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity, characterised in that the said copolymer is water soluble in a neutral or alkaline medium and in that it consists of copolymers composed of:
 - A) 25% to 45% by weight monomer units whose homopolymer has a $T_g > 90^\circ\text{C}$,
 - B) 30% to 65% by weight anionic monomer units,
 - C) 0% to 30% by weight non-ionic monomer motives other than the monomers A),
 - D) 0% to 5% by weight cross-linking monomer units.
2. The use, for the manufacture of paper coating colors, of a copolymer according to Claim 1, characterised in that the said copolymer is water-soluble in a neutral or alkaline medium and in that it consists of copolymers composed of:
 - A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
 - B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
 - acrylamido methyl propane sulphonic acid or AMPS,
 - ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
 - sodium methallylsulphonate (MTAS) or allylsulphonate,
 - itaconic acid,

- sodium styrene sulphonate,
- tetrahydrophthalic anhydride.

5 C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen from amongst acrylic or methacrylic acid esters or ethers, oxyalkylated monomers with ethylenic non-saturation terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups having 1 to 50 carbon atoms and in particular the di- tri- and tetrasterylphenol groups or the nonylphenols, or chosen from amongst vinyl esters, allyl esters or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, unsaturated urethanes, acrylamides and methacrylamides, substituted or not,

D) 0% to 5% by weight crosslinking monomer units chosen from amongst the monomers having at least two ethylenic non-saturations.

15 3. The use, for the manufacture of paper coating colors, of a copolymer according to Claim 2, characterised in that the said copolymer is water-soluble in a neutral or alkaline medium and in that it consists of copolymers composed of:

- A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
- B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:

- 20 - acrylamido methyl propane sulphonic acid or AMPS,
- ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
- sodium methallylsulphonate (MTAS) or allylsulphonate,
- itaconic acid,

- sodium styrene sulphonate,
- tetrahydrophthalic anhydride.

5 C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen more particularly from amongst methyl, ethyl, butyl, 2-ethyl-hexyl, ethylene or propylene glycol acrylates or methacrylates, oxyethylated acrylates or methacrylates terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups with 1 to 50 carbon atoms and in particular the di-, tri- and tetrasterylphenol groups, nonylphenols, vinyl acetate, allyl ethers or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, acrylurethanes, methacrylurethanes, α - α' dimethyl-m-isopropenylbenzyl urethane, allylurethane, acrylamides and methacrylamides, substituted or not.

15 D) 0% to 5% by weight monomer units having at least two ethylenic non-saturations chosen from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, the triallylcyanurates, the trivinylcyclohexane the allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose or others.

20 4. A novel agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity, characterised in that the said agent is a copolymer water-soluble in a neutral or alkaline medium and in that it is composed of:

- A) 25% to 45% by weight monomer units whose homopolymer has a $T_g > 90^\circ\text{C}$,
- B) 30% to 65% by weight anionic monomer units,
- C) 0% to 30% by weight non-ionic monomer motives other than the monomers A),
- 25 D) 0% to 5% by weight cross-linking monomer units.

5. A novel agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity according to Claim 4, characterised in that the said agent is a copolymer water-soluble in a neutral or alkaline medium and in that it is composed of:

- 5 A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
- B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
- acrylamido methyl propane sulphonic acid or AMPS,
 - ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
 - sodium methallylsulphonate (MTAS) or allylsulphonate,
 - itaconic acid,
 - sodium styrene sulphonate,
 - tetrahydrophthalic anhydride.
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- 15 C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen from amongst acrylic or methacrylic acid esters or ethers, oxyalkylated monomers with ethylenic non-saturation terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups having 1 to 50 carbon atoms and in particular the di- tri- and tetrasterylphenol groups, the nonylphenols, or chosen from amongst vinyl esters, allyl esters or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, unsaturated urethanes, acrylamides and methacrylamides, substituted or not,
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- D) 0% to 5% by weight of crosslinking monomer units chosen from amongst the monomers having at least two ethylenic non-saturations.

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6. A novel agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity according to Claim 5, characterised in that the said agent is a copolymer water-soluble in a neutral or alkaline medium and in that it is composed of:

- 5 A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
- B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
- acrylamido methyl propane sulphonic acid or AMPS,
 - ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
 - sodium methallylsulphonate (MTAS) or allylsulphonate,
 - itaconic acid,
 - sodium styrene sulphonate,
 - tetrahydrophthalic anhydride.
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- 15 C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen more particularly from amongst methyl, ethyl, butyl, 2-ethyl-hexyl, ethylene or propylene glycol acrylates or methacrylates, oxyethylated acrylates or methacrylates terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups with 1 to 50 carbon atoms and in particular the di-, tri- and tetrastyrilphenol groups or the nonylphenols, or even more particularly chosen
- 20 from amongst vinyl acetate, allyl ethers or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, acrylurethanes, methacrylurethanes, α - α' dimethyl-m-isopropenylbenzyl urethane, allylurethane, acrylamides and methacrylamides, substituted or not.

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- 5 D) 0% to 5% by weight monomer units having at least two ethylenic non-saturations chosen from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, the triallylcyanurates, the trivinylcyclohexane, the allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose or others.

7. A paper coating color characterised in that it contains, in addition to the usual additives, the novel agent according to any one of Claims 4 to 6.

- 10 8. A paper coating color according to Claim 7, characterised in that it contains, in addition to the usual additives, 0.1% to 2.0% by dry weight and preferentially 0.5% to 1.0% by dry weight, with respect to the dry weight of the fillers, of the novel agent according to any one of Claims 4 to 6.

9. A paper coating color according to either one of Claims 7 or 8, characterised in that its water retention and Brookfield viscosity are adjusted simultaneously.

- 15 10. Paper and cardboard coated with the coating color according to any one of Claim 7 to 9.